

CLAIMS:

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent is:

- 1 1. In a network environment including one or more network processing (NP) devices implemented for communicating packets, each NP device supporting a forwarding table comprising entries to enable forwarding of received data packets from a source device to a destination device according to a routing protocol via a network connection, said network device routing receiving updated forwarding table entries from one or more network control devices executing routing protocol applications, a method for updating forwarding table entries comprising:
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 - 9 a) generating for each forwarding table entry update, a data structure indicating identification of the routing protocol application and a version of a particular routing protocol application instance generating said entry update, said data structure received by said forwarding table and incorporated within a respective forwarding table entry;
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 - 15 b) identifying for deletion forwarding table entries having data structures matching a designated selection criteria; and,
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 - 18 c) deleting said designated forwarding table entries, whereby old forwarding table entries in said forwarding table are updated efficiently without disrupting packet forwarding process.
- 1 2. The method for updating forwarding table entries in accordance with Claim 1, wherein said selection criteria includes a value representing a version of a particular routing

3 protocol application instance, said identifying step b) including the step of: identifying
4 said forwarding table entries having data structure indicating said value.

1 3. The method for updating forwarding table entries in accordance with Claim 1, wherein
2 said selection criteria includes an identification of the routing protocol application, said
3 identifying step b) including the step of identifying said forwarding table entries having
4 data structure indicating said routing protocol application.

1 4. The method for updating forwarding table entries in accordance with Claim 1, wherein
2 said selection criteria includes a range of values indicating versions of particular routing
3 protocol application instances, said identifying step b) including the step of: identifying
4 said forwarding table entries having data structure indicating a version falling within said
5 range.

1 5. The method for updating forwarding table entries in accordance with Claim 1, wherein
2 said generating step a) is performed by one or more network control devices.

1 6. The method for updating forwarding table entries in accordance with Claim 1, wherein
2 said identifying step b) includes the step of generating said selection criteria.

1 7. The method for updating forwarding table entries in accordance with Claim 1, wherein
2 said step of generating said selection criteria is performed by said one or more network
3 control devices.

1 8. The method for updating forwarding table entries in accordance with Claim 1, wherein
2 said forwarding table is a binary tree structure having leaves comprising said table
3 entries, said identifying step b) including the step of implementing a scanning technique
4 for ascertaining the designations at each of said leaves.

1 9. A system for ensuring packet routing in a networking environment including one or
2 more network processing (NP) devices implemented for communicating packets, each
3 NP device supporting a forwarding table comprising entries to enable forwarding of
4 received data packets from a source device to a destination device according to a routing
5 protocol via a network connection, said network device routing receiving updated
6 forwarding table entries from one or more network control devices executing routing
7 protocol applications, said system comprising:

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9 control mechanism for generating a data structure indicating identification
10 of the routing protocol application and a version of a particular routing protocol
11 application instance when a forwarding table is to be updated;

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13 communications interface for enabling forwarding of said data structure to
14 said NP device with each corresponding updated table entry;

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16 mechanism for incorporating received data structure into said forwarding
17 table entry when updating said forwarding table entry; and,

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19 synchronization mechanism for identifying forwarding table entries
20 having data structures matching a designated selection criteria and deleting those
21 forwarding table entries having data structures matching said designated selection
22 criteria,

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24 whereby old forwarding table entries in said forwarding table are updated
25 efficiently without disrupting packet forwarding process.

1 10. The system as claimed in Claim 9, wherein said selection criteria includes a value
2 representing a version of a particular routing protocol application instance, said
3 identifying step b) including the step of: identifying said forwarding table entries having
4 data structure indicating said version.

- 1 11. The system as claimed in Claim 9, wherein said selection criteria includes an
2 identification of the routing protocol application, said synchronization mechanism
3 identifying said forwarding table entries having data structure indicating said routing
4 protocol application.

- 1 12. The system as claimed in Claim 9, wherein said selection criteria includes a range of
2 values indicating versions of particular routing protocol application instances, said
3 synchronization mechanism identifying said forwarding table entries having data
4 structure indicating a version falling within said range.

- 1 13. The system as claimed in Claim 9, wherein said control mechanism further generates
2 said selection criteria.

- 1 14. The system as claimed in Claim 9, wherein said forwarding table is a binary tree
2 structure having leaves comprising said table entries, said synchronization mechanism
3 performing scanning of said leaves for ascertaining the corresponding data structures.